EXPECTED
TARGET FER

110

$1 = P(D|E)$ ~120

$P(D|E)$ ESTIMATE ~130

COMMUNICATION
CHANNEL CONDITIONS ~140

~100

OUTER LOOP TARGET FER

FIG 1

2100 → (A)

2102 — NEXT FRAME

2110 — GOOD FRAME DETECTED ?
Y → DECREASE SETPOINT BY SETP_DOWN_STEP_SIZE (2114) → CLR DTX COUNTER (2116)
N ↓

2120 — ERASURE DETECTED ?
Y → INCREASE SETPOINT BY SETP_UP_STEP_SIZE (2124) → CLR DTX COUNT (2126)
N ↓

2130 — DTX DETECTED INCREMENT DTX COUNT

2140 — N_DTX_S0_TO_S1 CONSECUTIVE DTX INDICATIONS
N →
Y ↓

2200 → (B)

STATE 0

FIG 2A

2200 — B

2202 — NEXT FRAME

2210 — GOOD FRAME DETECTED ? — Y → DECREASE SETPOINT BY SETP_DOWN_STEP_SIZE — 2214

CLR DTX COUNTER — 2216 → A — 2100

N

2220 — DTX DETECTED ? — Y

N

2230 — ERASURE DETECTED

2232 — CLR DTX COUNTER

2234 — INCREASE SETPOINT BY SETP_UP_STEP_SIZE

2236 — S2_COUNT ≤ 1

2300 — C

STATE 1

FIG 2B

G 2300

NEXT FRAME 2302

2310

GOOD FRAME DETECTED ? — Y → DECREASE SETPOINT BY SETP_DOWN_STEP_SIZE 2314

SET S2_COUNT = 0 2316

CLR DTX COUNTER 2318

A 2100

N

2320 ERASURE DETECTED — Y → INCREASE SETPOINT BY SETP_UP_STEP_SIZE 2324

INCREMENT S2_COUNT 2326

CLR DTX COUNTER 2328

DTX DETECTED 2330

SET S3_COUNT = 1 2332

D 2400

STATE 2

FIG 2C

D — 2400

NEXT FRAME — 2402

2410
GOOD FRAME DETECTED ? — Y → DECREASE SETPOINT BY SETP_DOWN_STEP_SIZE — 2412

SET S2_COUNT = 0 — 2414

SET S3_COUNT = 0 — 2416

CLR DTX COUNTER — 2418

A — 2100

N

2420
ERASURE DETECTED ? — Y → INCREASE SETPOINT BY SETP_UP_STEP_SIZE — 2422

INCREMENT S2_COUNT — 2424

SET S3_COUNT = 0 — 2426

CLR DTX COUNTER — 2428

2300 C

DTX DETECTED — 2430

INCREMENT S3_COUNT — 2432

S3_COUNT COMP — 2440

STATE 3

FIG 2D

2440

REVERSE OUTER LOOP

Is
S3_COUNT
>=
N_DTX_LOWER_SETPOINT
? — 310

Is
S2_COUNT
>
0
? — 320

DECREASE SETPOINT
BY S2_COUNT * SETP_UP_STEP_SIZE * K — 330

SET S2_COUNT = 0 — 332

SET S3_COUNT = 0 — 334

DONE — 340

S3_COUNT COMPENSATION

FIG 3

!A / ERASURE, ↑ SETP_UP_STEP_SIZE
GOOD, ↓ SETP_DOWN_STEP_SIZE
DTX , NO CHANGE

A : # of consecutive DTX frames == N_DTX_S0_TO_S1

FIG. 4

FIG 6